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**New or Otherwise Interesting Tertiary Molluscan
Species from the East Coast of America**

BY

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AND

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MOLLUSCAN SPECIES FROM THE EAST COAST
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INTRODUCTION

In resuming an intensive study of the east American Tertiary molluscan fauna after an interval of about twenty years, devoted of necessity to other phases of investigation, the senior author finds that there has accumulated in our laboratory several little lots of fossils, odds and ends, so to speak, that will scarcely fit into the general systematic studies here being undertaken, for some time to come. But a knowledge of these fossils and their occurrence may not be without interest now to Tertiary geologists and paleontologists in that they may give suggestions as to where to look and what to look for in various out-of-the-way places.

The junior author has endeavored to clear up some of the obscure points in the molluscan faunas of the Eocene of Virginia and Trinidad, while the the senior author is responsible for what is said regarding those from the Carolinas and Texas.

REMARKS ON VIRGINIA EOCENE FOSSILS

By KATHERINE VAN WINKLE

The following notes and descriptions are based on material collected by members of the first cruise of the IANTHINA in Virginian waters in 1897. Most material, then new, has been subsequently described by members of the Maryland Geological Survey; and interesting geographic data on the Virginian beds have been published by members of the Survey of that State. However, these few additional notes seem worthy of publication.

Genus **LEDA** Schumacher**Leda cœlatella**, n. sp.

Pl. I Figs. 4, 5

Specific characterization.—Size and general form as indicated by the figures and explanations; rather thick; of the *cœlata* stock, but differing from the Claiborne form by its smaller size, less inflation medially, less relative contraction posteriorly and especially by its more primitive surface marking—great diagonal rugæ of nearly equal strength across the whole valve with only a down-dipping in the young stage as they approach the umbonal ridge, whereas in *cœlata* these rugæ are strong only on the sector just posterior to the middle; in advance of the same such markings become fainter, swing upward across the channel from beak to antero-basal margin and finally resume their former direction till they reach the margin of the shell; lunule, escutcheon and post-umbonal markings very similar to those of *cœlata*, though the radial ribs are more generally and coarsely granulate, thus recalling *cœlatoides*.

Types and specimens figured.—Paleontological Museum, Cornell Univ.

Horizon.—Probably lower St. Maurice Eocene.

Locality.—New Castle, Va. Collected by 1st Ianthina Expedition, '97.

Genus **CORBULA** Bruguière

Anapteris, new subgenus

Description.—Lesser or left, only valve known; large, flat, surface of shell strongly corrugated, this corrugation extends to the anterior margin where the extreme, anterior portion of the valve appears as though it had been broken; on the interior of the shell this area corresponds to a wing or flare which is bounded below by a strong ridge; this ridge suggests the original margin of the valve. The wing bears very fine, radiating striæ.

Anapteris regalis, n. sp.,

Pl. I Fig. 1, 3

Description.—Size and shape of shell as indicated by the figures. Left valve nearly flat, thick, dorsal margin bent outward, giving intimation of a gape; a pronounced carina extends from the beak to the posterior margin. Surface ornamented with prominent, concentric lines which extend from the umbonal ridge to the anterior end where they terminate in a peculiar manner as though the anterior end had been broken; on the posterior portion of the shell anterior to the umbonal ridge where the lines merge into the ridge a separation of the lines occurs giving place to very short, equally prominent, surface markings. Just anterior and parallel to the umbonal carina is a fine channel; the prominent lines posterior to the umbonal ridge extend almost vertically to the dorsal margin. On some specimens two slight channels are noted which are situated between the dorsal margin and the posterior ridge and extend from the beak to the posterior margin; on the anterior internal surface of the left valve a raised margin-like ridge extends from the beak concavely, and then rounds into the ventral margin; the portion of the shell dorsal to the ridge has the appearance of a flare or wing. The projecting, cartilage process in the left valve in this form differs from that in the genus *Corbula*, in having only a very narrow, short, posterior groove; the anterior groove is slightly marked, in some cases practically obsolete.

Types and specimens figured.—Paleontological Museum, Cornell Univ.

Horizon.—St. Maurice Eocene.

Localities.—Newcastle, Piping Tree, Va; collected by the 1st Ianthina Expedition, '97.

Genus **FICUS** Klein

Ficus affinis, n. sp.,

Pl. I Fig. 10, a.

Description.—Size and shape of shell as indicated by the figures; whorls five; last two whorls of spire smooth; whorls very convex; surface ornamented by numerous, subequally spaced, longitudinal ribs; the intersection of the ribs gives the surface of the shell a cancellated appearance; both the longitudinal and revolving lines extend over the full length of the body whorl and the first two whorls of the spire.

This form resembles in general outline the species *Ficus mississippensis* (Conrad) from Vicksburg but differs in the greater regularity of the revolving ribs, in the smaller interspaces between the revolving ribs and in the absence of finer, intervening, revolving lines which are characteristic of *F. mississippensis*. These lines vary in the young and adult stages of the Vicksburg form, from one to two in number. A single, partially developed, intervening line is noted on a specimen of *F. affinis*. The general resemblance of the two species seems to indicate *F. affinis* as the ancestor of *F. mississippensis*.

Types and specimens figured.—Paleontological Museum, Cornell Univ.

Horizon.—St. Maurice Eocene.

Locality.—James river, just below City Point, Va.; 16 or 17 miles above Newburn, on the Neuse river, N. C. Collected by the 1st Ianthina Expedition, '97

Genus **SOLARIUM** Lamareck

Solarium ianthinae, n. sp.

Pl. I Figs. 7, 8, 9

Description.—Size and general shape of shell as indicated by the figures; whorls five or six; slightly convex; two revolving channels or furrows extend on the surface of the whorls dividing each whorl into three equal, slightly, elevated areas; about one-

third the distance between the suture and the upper furrow a fine groove occurs which gives to the upper portion of the whorl the appearance of a narrow ridge. Numerous longitudinal striæ occur over the whole surface of the whorls, much enlarged on the margin of the whorl just below the suture, giving a slight crenulated appearance; base flat.

Type and specimens figured.—Paleontological Museum, Cornell Univ.

Horizon.—St. Maurice Eocene.

Locality.—James river, just below City Point, Va. Collected by the 1st Ianthina Expedition, '97.

Genus **ADEORBIS** S. Wood

Adeorbis novi-castri, n. sp.,

Pl. I Fig. 11, 12

Description.—Size and general shape as indicated by the figures; whorls four or five; spire depressed; suture area excavated; whorls marked with a strong carina just above the suture; surface smooth except for fine lines of growth. Body whorl discoidal, ornamented with three very strong, equally distant carinæ; aperture subovate, posterior margin straight; umbilicus moderately large, surface decorated with fine, regularly, revolving striæ; base convex, smooth; at about the middle of the volution of the body whorl the basal carina divides, gradually producing two ribs or ridges of equal size with a slight interspace; they appear to merge into the aperture as one carina, but examination under the microscope shows the dual character.

Type figured.—Paleontological Museum, Cornell Univ.

Horizon.—St. Maurice Eocene.

Locality.—Newcastle, Va. Collected by 1st Ianthina Expedition '97.

Adeorbis? virginiensis, n. sp.,

Pl. I Fig. 13

Description.—Size and shape as indicated by the figures; whorls five; suture appressed; surface ornamented by very fine, revolving striæ which occur on the lower portion of each whorl, beginning at the suture and extending about half the width of

the whorl; the remaining portion of the whorls smooth except for fine lines of growth; near the suture, on the uppermost portion of the preceding whorl a heavy, revolving line or groove extends which gives the surface an appressed-ridged appearance. On the body whorl, the fine, revolving lines of the lower portion extend continuously over the margin and probably over most of the surface of the base.

Types and specimens figured.—Paleontological Museum, Cornell Univ.

Horizon.—St. Maurice Eocene.

Locality.—Newcastle, Va. Collected by the 1st Ianthina Expedition '97.

GEOGRAPHICAL DISTRIBUTION OF MID-EOCENE FAUNA OF THE VIRGINIA BASIN

PELECYPODA

Anapteris regalis, n. sp., Piping Tree.

Anomia lisbonensis Aldrich, Coggins Point.

Anomia marylandica C. & M., Port Royal.

Corbula alabamiensis Lea, Port Royal, Ratcliff, Piping Tree, Newcastle.

Corbula aldrichi Meyer, Popes Creek, Port Royal, Ratcliff, Piping Tree.

Corbula murchisoni Lea, Newcastle, Popes Creek

Crassatellites alaeformis (Conrad), Potomac Creek, Piping Tree, below City Point, Coggins Point.

Cucullæa onochela Rogers, Potomac Creek, Newcastle.

Cucullæa transversa Rogers, Potomac Creek.

Dosiniopsis lenticularis Rogers, Potomac Creek.

Glycymeris idoneus (Conrad) ? Newcastle, Coggins Point.

Glycymeris, sp., Port Royal.

Lævicardium, sp., Coggins Point.

Leda magna Lea ? Coggins Point.

Leda improcera (Conrad), Port Royal, Marshfield, Woodstock

Leda cultelliformis (Rogers), Popes Creek, Woodstock.

Leda cælatella, n. sp., Port Royal.

Leda, sp., Coggins Point.

Lucina alveata Conrad, Piping Tree.

Lucina dartoni Clark, Popes Creek.

Lucina papyracea (Lea), Newcastle.

Lucina uhleri Clark, Port Royal, Ratcliff.

Lucina whitei Clark, Popes Creek.

- Lucina claibornensis* Conrad, below City Point.
Necera, sp., Newcastle.
Nucula potomacensis C. & M., Popes Creek, Newcastle, below City Point, Coggins Point, Piping Tree.
Meretrix ovata var. *pyga* Conrad, Potomac Creek, Popes Creek, Woodstock, below City Point, Coggins Point.
Meretrix lenis (Conrad), Port Royal.
Meretrix subimpressa Conrad, Popes Creek, Piping Tree, Newcastle, below City Point.
Meretrix, sp., Port Royal.
Modiolus alabamensis Aldrich, Potomac Creek, Popes Creek, Port Royal, Ratcliff.
Ostrea sellæformis Conrad, Popes Creek, Piping Tree, below City Point, Coggins Point.
Ostrea compressirostra Say, Potomac Creek.
Protocardia, sp., Popes Creek.
Pecten choctawensis Aldrich, Popes Creek.
Pecten greggi (Harris), Potomac Creek.
Pecten dalli Clark, Woodstock.
Semele linosa Conrad var. Harris, below City Point.
Spisula paralis (Conrad), Newcastle.
Teredo virginiana Clark, Popes Creek.
Tellina mooreana Gabb? Marshfield.
Tellina, sp., Popes Creek.
Tellina, sp., Piping Tree.
Venericardia planicosta var. *regia* Conrad, Potomac Creek, Popes Creek, Piping Tree?, Newcastle.
Venericardia potapocensis C. & M., Potomac Creek, Coggins Point.

GASTROPODA

- Adeorbis novi-castris*, n. sp., Newcastle.
Adeorbis? *virginiensis*, Newcastle.
Calyptraphorus trinodiferus Conrad, Port Royal, Piping Tree?, Newcastle.
Calyptraphorus velatus Conrad, Coggins Point.
Calyptraphorus, sp., Below City Point.
Calyptra aperta (Solander), Popes Creek, Newcastle, below City Point.
Caricella pyruloides? Conrad?, Below City Point.
Clavella hercules Whitfield?, Ratcliff.
Crepidula livata Conrad, Newcastle, below City Point, Coggins Point.
Ficus affinis, n. sp., Below City Point.
Fusus? *interstriatus* Heilprin, Ratcliff.
Fusus irrasus Conrad, Newcastle.
Fusus subtenis Heilprin, Port Royal.
Fulguroficus argutus Clark, Potomac Creek.
Lunatia marylandica (Conrad), Potomac Creek, Piping Tree, Newcastle.
Lunatia, sp.,
Marginella, sp., Coggins Point.

- Mitra pomonkensis*, C. & M., Potomac Creek.
Plejona petrosa (Conrad), Potomac Creek, Ratcliff, Newcastle.
Pseudoliva vestuta var. *clausa* Harris, Newcastle.
Pseudoliva, sp., Coggins Point.
Solarium ianthinæ, n. sp., below City Point.
Strepsidura subscalarium Heilprin, Potomac Creek, Newcastle.
Teinostoma lævis (Meyer), Newcastle.
Teinostoma subrotunda Meyer?, Newcastle.
Tuba marylandica C. & M., Potomac Creek.
Tudicla, sp., C. & M., Ratcliff.
Turritella clevelandia Harris, Newcastle.
Turritella humerosa Conrad, Potomac Creek, Ratcliff, below City Point,
Coggins Point, Fort Washington.
Turritella nasuta Gabb var. *houstonia* Harris, Ratcliff.
Turritella mortoni Conrad, Potomac Creek, below City Point.
Vermetus, sp., below City Point.

SCAPHOPODA

- Dentalium asgum* De Gregorio, Newcastle.
Dentalium minutistriatum Gabb, Newcastle.
Dentalium thalloides Conrad, Popes Creek, Newcastle.
-

Shark's teeth Potomac Creek, Newcastle.

A FEW MID-UPPER EOCENE FOSSILS FROM THE CAROLINAS AND TEXAS.

BY

G. D. HARRIS

The following specimens from isolated localities whose geologic horizons are for the most part not very definitely established seem worthy of description and illustration.

Venericardia eutawcolens,

Pl. 2. Fig. 1, 2

Specific characterization.—Size and general form as indicated by the figures and explanations; rather inflated; substance of the shell rather thin, showing on molds of the interior the position of the ribbing; ribs about 28-30 in number, compound, tripartite, the middle part strongest, highest and most crenulate or spinose; interspaces from $\frac{1}{2}$ to $\frac{1}{3}$ the width of the compound ribs; ribs about the umbonal region simple, finely crenulate, distinctly so just in front of the lunule which is small, deeply sunken.

The ornamentation, or ribbing of this form differs materially from that of any other species of the genus with which we are acquainted. In the usual *alticostata* type of ribbing there is a central keel superimposed upon a broader foundation, giving a terraced structure on each side. Here there are actually three raised, radiating, nodose, strong riblets upon each rib, the center one being somewhat the strongest, however. This reminds one of the exterior markings on some *Pectens*.

The ribs in Conrad's *V. blandingi* are of the very carinate "*wilcoxensis*" type and not of the trilinear style of our new form. The "side-ribs" in *perantiqua* as figured by Whitfield in Mon. U.

S. G. S., No. 9, pl. 30 lack the prominence of those in the South Carolina form and are not nodose while the interspaces are as wide as the ribs.

Type.—C. U. Museum.

Locality.—Eutaw Springs and Centre Hill, S. C. ; specimens are casts in a hard creamy-white limestone.

Metis ? eutawensis, n. sp.,

Pl. 2. Fig. 3.

Characterization.—A quadrangular cast of the interior of a Tellinoid shell measuring $45 \times 37 \times 8$ mm., showing no signs of lateral teeth, with but faint indication of a posterior flexure, but with traces of a profound pallial sinus ; interiorly with low ridges radiating before and behind the anterior muscular scar, accurately delimiting the same, while the posterior muscular scar is not sharply defined ; post-umbonal slope clearly defined but not marked off by a sharply carinated ridge.

Type.—Paleont. Museum, Cornell Univ.

Locality.—Eutaw Springs, S. C. Expedition of '98.

Crassatellites eutawcolens, n. sp.,

Pl. 2. Fig. 4.

Characterization.—Internal cast of a medium sized ($39 \times 30 \times 10$ mm), sharply angular and elevated form, quite different from any known Eocene *Crassatellites* above the basal beds of the Gulf States ; marginal crenulation fine on the posterior, very coarse postero-basally and disappearing anteriorly ; basal margin rather full or sub-angular medially ; umbonal ridge sharply defined ; exterior apparently with well-defined, even, concentric lirations.

Type.—Paleont. Museum, Cornell Univ.

Locality.—Eutaw Springs. Cornell Expedition of '98.

Meiocardia carolinæ, n. sp.,

Pl. 2. Figs. 5, 6.

Characterization.—Size and general appearance as indicated by the figures ; inflated, with a well-defined post-umbonal slope, on which, about two-fifths way from the ridge to the ligamental margin there is a well-defined radiating ridge ; traces of interior radiating lines sometimes present ; marginal impressions indicating a fairly thick shell ; concentric undulations noticeable

basally and posteriorly.

Small casts of these species are common at Wilmington and Eutaw Springs. Sometimes at the former locality specimens the size of fig. 5 are found. An impression of the exterior of what appears to be the same species is in our collections, labelled Neuse River, 16-17 miles above Newbern, N. C. This shows, besides rather regular concentric undulations posteriorly, fine concentric lining. These lines are almost rectilinear medially but curve up rather abruptly anteriorly and posteriorly. This reminds one of Dall's *M. agassizi*, a recent West Indian species.

Types.—Paleont. Museum, Cornell Univ.

Localities.—Eutaw Springs, S. C. ; Wilmington, N. C., and Neuse River above Newbern.

***Pecten trentensis*, n. sp.,**

Pl. 2. Figs. 8, 9.

Specific characterization.—Form and size as indicated by the illustrations ; ribs highly variable in number, size and amount of ornamentation ; generally bifid and generally ornamented by highly raised, scale-like or imbricating concentric lines ; costation showing a strong tendency towards a tri- or quinque-costate pattern, especially in the left valve ; central rib largest of the three or five major ones.

The general appearance of this shell is so different from anything we have heretofore found in the Eocene of this part of the United States that, owing to a lack of well-known species from the same locality, its horizon must at present be considered as doubtful.

Type and specimens figured.—Deposited by G. D. Harris in Museum at Cornell Univ.

Locality.—Found in light, marly bed, right bank of Trent river, near the water's edge, about six miles below Pollocksville, North Carolina, in the so-called Trent formation. The latter has been referred to the upper Claiborne or Jackson Eocene.

***Pecten elixatus* Con. ?**

Pl. 2. Figs. 10, 11.

A few fragments of another species of *Pecten* were found

among the representatives of the species just described, which seem at first sight to belong to *P. poulsoni*. But upon direct comparison of the two the left valve of *poulsoni* is never flat and in some instances decidedly gibbous, whereas in this species the fragment figured indicated a plane, or even concave valve. Again, the ribs on the posterior ear are much more numerous in this North Carolina species and the posterior cardinal angle less than 90° . The tops of the ribs in *poulsoni* appear broad and tri-partite; in this species, bi-partite. The concentric sculpturing is much the same in both species. However, a large series of these forms may cause them to be finally regarded as one species. If so, it would seem that a considerably greater geologic range should be given to this species than has been admitted heretofore else the horizon on the Trent whence these specimens came is far higher than has been suspected. A rather near relative of *poulsoni* has been described by Dall as *Burnsii* from the Chipola marls of Florida. (Trans. Wag. III, 1898, p. 720, pl. 34, fig. 8.) Conrad's *elixatus* from "near Santee Canal, South Carolina, in white, friable limestone" is generally referred to *poulsoni* Mort.

***Pecchiolia dalliana*, n. sp.,**

Pl. 2, Fig. 7.

Specific characterization.—Size and general appearance as indicated by the figure; extremely inflated and generally Exogyroid surface marked by numerous radiating small ribs becoming stronger and farther apart as the position of the umbonal ridge is approached; there occasional inter-riblets appear; passing the umbonal ridge the strength of the ribs decreases to the ligamental margin; a radiating channel divides the post-umbonal into two nearly equal portions; concentric markings consist of numerous rather irregular and ill-defined undulations, strongest basally.

This shell is strikingly similar to *P. wemmelensis* Vincent from the "Sables de Wemmel" (Bull. Soc. royal Mal. de Belg. vol. 32, 1897, p. xxx) and, since these sands are the equivalent of the Barton Beds of England one instinctively thinks of the aid, small though it may be, that this form may render us in correlating the upper Eocene deposits on either side of the Atlantic.

Our specimen is mainly in form of a cast, from the City Quarry near Wilmington, N. C., found among many other beautiful molluscan remains, echinoderms and branchipods.

We take great pleasure in styling this the Dall *Pecchiolia* not only on account of the great and valuable Tertiary work of this author, but especially on account of his early extensive and painstaking work on this branch of Pelecypoda.

Type.—Deposited by Harris in Museum at Cornell.

Meretrix angelinæ n. sp.,

Pl. 2. Figs. 12, 13.

Specific characterization.—Shell large (65x54x15mm) and oblong, as indicated by the figures; anterior somewhat extended as in *Cornelli* but posterior not with broad circular sweep of concentric lines, but with more or less of a rectilinear truncation; pallial sinus small, V-shaped; anterior muscular scar sharply defined, posterior scarcely visible; a few obscure radiating ridges internally and a few radiating lines.

This large species, (figures somewhat less than life size,) is found in the state of casts and impressions in sandy ironstone fragments gathered by A. C. Veatch along the Angelina River, Angelina County, Texas, 2 miles above Marion.

It seems very different from anything with which we are acquainted in the lower Eocene beds, and is here associated with an abundance of *Anomia*, (also *Plicatula filameatosa*, *Ostrea* var. *vermilla*, *Sphærella bulla* and *anteproducta*,) reminding one strongly of the St. Maurice beds of Louisiana; also a small, smooth *Pecten*; but most telling among its associates are *Haminea grandis*, *Pleuratoma creno-strinata* Heilp., of Jackson age; but one of the most abundant species is *Rimella* cf. *texana*, a St. Maurice form. A *Fusoficula* and an unusually large *Tornatina* are among the undescribed associates. (See below.)

Types.—Deposited in the Paleont. Mus., Cornell Univ.

Tornatina angelinæ, n. sp.,

Pl. 2. Fig. 14.

Specific characterization.—Form and general appearance as figured; shell thin, smooth, marked only by indistinct longitud-

inal lines of growth which swing forward in the medial portion of the volution giving the margin of the lip a broad, curved form ; margin of the lip somewhat in-flected ; spire very short, of scarcely over two volutions, suture broadly channelled.

This is a large, imposing type of *Tornatina*, measuring in adult specimens 23mm. in length by 13 in diameter. It is found abundantly in the material above described in association with *Meretrix angelina*.

***Fusoficula angelinensis*, n. sp.,**

Pl. 2. Fig. 15.

Specific characterization.—More or less long—*Scaphella*-shaped as illustrated ; differing from all other members known to the writer in its elongate form, with no traces of a shouldering above on the body whorl and no traces of tri-carination medially ; revolving lines stronger than the longitudinal, and showing generally a secondary intermediate lesser series.

Found associated with the above on Angelina River, Tex.

REMARKS ON SOME NEW SPECIES FROM TRINIDAD

BY

KATHERINE VAN WINKLE

The material from which the following species were obtained was collected in 1912, on the island of Trinidad by A. C. Veatch under the auspices of the General Asphalt Company of Philadelphia, Miss Carlotta J. Maury being the Paleontologist. The stratigraphy and paleontology was subsequently worked up by Dr. Maury and published in the Journal of the Academy of Sciences of Philadelphia. A few forms not reported seem interesting and worthy of description.

Thanks are due to Professor Harris for the use of the material from both Virginia and Trinidad and for suggestions in the determinations.

The descriptions of the localities where these forms were collected have been taken from the notes of Miss Maury, that were found with the material.

Genus **ASTARTE** Sowerby

Astarte mauriana, n. sp.,

Pl. 3. Fig. 1.

Description.—Size and shape of shell as indicated by the figures; inequilateral, beaks situated about one-third the length of the shell from the anterior end; a very slight, umbonal ridge extends from the beaks part way down the posterior end of the shell causing a faint, noticeable concavity behind; surface ornamented with wide, heavy concentric ribs, interspaces half the width of the ribs. In the situation of the beaks and in general outline this form varies from a typical *Astarte* and recalls the form of *Pitaria* or allied Venerid genera. Longitude of shell 15mm;

altitude 12mm.

Type and specimens figured.—Pal. Museum., Cornell Univ.

Geologic horizon.—Midway Eocene.

Locality.—"Bed No. 2; Soldado Rock, Gulf of Paria, Trinidad."

Collected by A. C. Veatch in 1912, then of the General Asphalt Company of Philadelphia.

Astarte trinidadensis, n. sp., Pl. 3. Figs. 2, 3.

Description.—Size and shape of the shell as indicated by the figures; subequilateral; lower portion of the anterior and posterior ends similarly rounded, blunt in outline; surface decorated with six prominent, narrow, raised concentric ribs, the interspaces very wide, two or three times the width of the ribs. This species differs from *A. mauriana*, n. sp., in the beaks being more central, in a more rounded posterior end, lower in form and in the character and number of the concentric ribs. In *A. trinidadensis* the ribs are more pronounced, much narrower and fewer in number. There are less than twice the number of ribs in this species than in our other form of *Astarte*. Longitude of shell 15mm; altitude 10mm.

Type and specimens figured.—Pal. Museum, Cornell Univ.

Geological horizon.—Midway Eocene.

Locality.—"Bed No. 2, Soldado Rock, Gulf of Paria, Trinidad." Collected by A. C. Veatch in 1912, then of the General Asphalt Company of Philadelphia.

Genus **MARCIA** H. and A. Adams

Marcia pariænsis, n. sp., Pl. 3 Figs. 4, 5.

Description.—Size and shape of shell as indicated by the figures; a slight umbonal ridge extends from the beaks to the posterior, ventral margin; surface ornamented with prominent, concentric lamellæ which are much more pronounced and heavier on the anterior and central portion of the valve, decreasing in size from the posterior umbonal ridge backward. Longitude of shell 16mm; altitude 13mm.

Type and specimens figured.—Pal. Museum, Cornell Univ.

Geologic horizon.—Midway Eocene.

Locality.—"Bed No. 2, Soldado Rock, Gulf of Paria, Trinidad."

Collected by A. C. Veatch in 1912, then of the General Asphalt Company of Philadelphia.

Genus **MACROCALLISTA** Meek

Macrocallista ? *veatchi*, n. sp.,

Pl. 3. Figs. 6, 7.

Description.—Size and shape of shell as indicated by the figures; high compared with the size of the shell; beaks situated nearly centrally, swollen; surface sculpture consists of numerous, moderate in size, radiating ribs with very narrow interspaces, less than one-half the width of the ribs. The first cardinal of the right valve differs from the type of *Macrocallista* in being a very large, heavy tooth, the posterior ligamental groove in this form is not as deep or external as in most species of *Macrocallista*. These characteristics, with the shortness of form probably makes the species of sectional rank. Longitude of shell 22mm: altitude 19mm.

Type and specimens figured.—Pal. Museum, Cornell Univ.

Geological horizon.—Midway Eocene.

Locality.—"Bed No. 2, Soldado Rock, Gulf of Paria, Trinidad."

Collected by A. C. Veatch in 1912, then of the General Asphalt Company of Philadelphia.

Genus **LEVIFUSUS** Conrad

Levifusus *whitei*, n. sp.,

Pl. 3. Fig. 11.

Description.—Size and shape as indicated by the figures; whorls five or six; on the specimen we have, the last volutions of the spire are broken, but the spire would probably measure half the length of the body whorl; suture distinct, appressed; a series of large, sharply rounded nodes occur on the upper portion of the body whorl about one-fourth the distance from the suture to

the anterior end ; upper volutions similarly decorated with nodes which begin at the sutural line and become obscure just above the central portion of the whorls ; surface of the shell smooth ; below the nodulation of the body whorl, with the aid of the microscope, very fine revolving striæ may be detected.

Type and specimens figured.—Pal. Museum, Cornell Univ.

Geologic horizon.—Midway Eocene.

Locality.—"Bed No. 2, Soldado Rock, Gulf of Paria, Trinidad."

Collected by A. C. Veatch in 1912, then of the General Asphalt Company of Philadelphia.

Genus **PSEUDOLIVA** Swainson

Pseudoliva soldadoensis, n. sp.,

Pl. 3. Fig. 10.

Description.—Size and shape of shell as indicated by the figures ; whorl, six, convex, with a slight shoulder ; last three volutions of the spire, narrow and very pointed ; the shoulder of the body whorl extends at about an angle of thirty degrees and bears numerous small nodes. Much of the surface of the body whorl of our specimen has been destroyed but on the remaining portion which is about a third of the whole whorl there are twelve nodes ; on the whorls of the spire a groove extends irregularly around the shoulder ; traces of nodes can be seen along the front of this groove. The surface of the shell is otherwise smooth except for lines of growth. This species is related to *Pseudoliva* sp. that Professor Harris has figured from the Midway of Alabama, pl. 9, fig. 22, Bulletins of American Paleontology, vol. 1, no. 4. They both have the small nodes on the shoulder of the body whorl and the upper portion of the spire, similarly shaped. *P. soldadoensis* n. sp. is a more robust form, the upper portions of the whorls are more convex and the nodes are more numerous. Altitude of the shell 33 mm ; diameter 20 mm ; altitude of spire 7 mm ; angle of spire 83° .

Type and specimens figured.—Pal. Museum, Cornell Univ.

Geological horizon.—Midway Eocene.

Locality.—"Bed No. 2, Soldado Rock, Gulf of Paria, Trinidad."

Collected by A. C. Veatch in 1912, then of the General Asphalt Company of Philadelphia.

Genus **ERATO** Risso

Erato vauhani (Maury)

Pl. 3 Figs. 8, 9.

Cypræa vauhani Maury, Jour. Acad. Nat. Sci. Phila., 2nd ser. vol. XV, 1912, p. 87, pl. XI, fig. 14, 15.

Original description.—"Shell small; pyriform, tapering to a pointed base; inflated; surface smooth except for faint lines of growth, which are most apparent on the earlier whorls; spire distinct, acute, showing two small volutions, with a clearly defined suture; aperture rather wide, but so filled with the indurated matrix that all plications are concealed; outer lip much thickened, inner lip with a rather fine callus.

Height of shell 24, greatest width 17, thickness 14 mm.

Remarks: This particular *Cypræa* is wholly unlike anything described from the lower Eocene horizons."

We have been able to obtain, since Miss Maury described this species, three additional specimens and remove the rock matrix so as to reveal the character of the aperture, the smooth columella and crenulated outer lip.

Size and shape of shell as indicated by the figures; whorls five; a deep posterior sulcus, the margin of the outer lip heightened or extending over the whorls of the spire as in many young *Cyprææ*; the very characteristic feature of this species is the elongate, *Pyrula*-like base or canal.

Specimens figured.—Pal. Museum, Cornell Univ.

Geological Horizon.—Midway Eocene.

Locality.—"Bed No. 2, Soldado Rock, Gulf of Paria, Trinidad."

PLEUROPHOPSIS, new genus

Description.—The form known only from casts; large, elongate, inequilateral, beaks situated about one-fourth the length of the shell from the anterior end; surface sculpture consists of heavy, concentric lines of growth; two cardinal teeth in the left valve, the posterior cardinal very large, the anterior slender;

right valve bears two cardinals of subequal size ; anterior adductor impression very large and high with a wide, deep groove behind, which would correspond on the shell to a deep adductor scar and ridge between it and the umbonal area ; pedal muscle scar conspicuous and situated dorsal to the adductor, posterior muscle impression and pallial line very indistinct, no sinus noticeable.

From the dental and muscular structure this form seems to be a descendant of the Pre-Tertiary genus *Pleurophorus*.

***Pleuropopsis unioides*, n. sp.,** Pl. 3. Fig. 12.

Unio sp. Maury, Jour. Acad. Nat. Sci. Phila., 2nd ser. vol. XV, 1912, p. 50, pl. VIII, figs. 18, 19.

Description.—Size and shape as indicated by the figures and explanations ; slight umbonal ridge extends from the beaks and merges into the posterior ventral margin ; surface sculpture consists of rather heavy, concentric lines of growth. Longitude of shell 77 mm ; altitude 33 mm.

Remarks.—This and the following new species from the same locality represent a large collection of casts, the hinge structure of which, for the most part, are but poorly preserved. The fauna is very peculiar and unlike any known. Because of its uniqueness and questionable origin it was thought that the forms should be figured and described as far as possible, thus placing on record the occurrence of such a fauna.

The species just described, in outline and in the occurrence of the heavy muscular impression, resembles a *Unio*. But the presence of clear cut dentition eliminates that genus. We have also in the collection a species of *Leda*, *Nucula* and *Modiolaria* as well as a number of marine gastropoda.

Type and specimens figured.—Pal. Museum, Cornell Univ.

Age.—Probably Middle Tertiary.

Locality.—"One mile west of Godineau River on the shore of the Gulf of Paria, about midway between San Fernando and La Brea, Trinidad."

Collected by A. C. Veatch in 1912, then of the General As-

phalt Company of Philadelphia.

Pleurophopsis unioides var. **fernandensis**, n. sp.,

Pl. 3. Fig. 13, 14.

Description.—Size and shape as indicated by the figures; umbonal ridge which extends nearly to the posterior, ventral margin well marked in the young; two very wide, deep furrows extend on the anterior portion of the shell from the area of the beak to the ventral margin; the groove most anterior extends practically straight to the basal margin, while the second groove extends obliquely toward the posterior end of the shell; where this furrow merges into the base, the margin of the shell forms an indentation, from here the anterior portion is drawn out at about an angle of 30 degrees to the dorsal margin; this gives the form an aviculoid appearance, this extreme contortion is characteristic of the large, adult specimens, the young show the two anterior furrows but are more moderate in form, showing the shape of the parent species, *P. unioides*; surface sculpture consists of heavy lines of growth which in the adult become very rugose along the umbonal ridge; longitude of shell 134 mm; altitude 55 mm.

Type and specimens figured.—Pal. Museum, Cornell Univ.

Age.—Probably Middle Tertiary.

Locality.—"One mile west of Godineau River on the shore of the Gulf of Paria, about midway between San Fernando and La Brea, Trinidad."

Collected by A. C. Veatch in 1912, then of the General Asphalt Company of Philadelphia.

THYASIRA Leach

Thyasira adoccasa, n. sp.,

Pl. 3. Fig. 15, 16.

Unio sp. Maury, Jour. Acad. Nat. Sci. Phila., 2nd ser. vol. XV, 1912, p. 50, pl. IX, fig. 1.

Description.—Shell attaining a very great size; shape as indicated by the figures, in the young form the shape is more quadrate, the posterior end less attenuated; in the young and intermediate stages a very characteristic, strong fold or flexure extends from the beaks to the posterior margin; this groove which is so marked in the early and medium stages is greatly reduced in

the adult.

Our collection of this species consists of a series of four specimens, which range in length, 22 mm, 87 mm, 118 mm and 123 mm respectively ; were it not for this series showing the gradation in size and umbonal ridge one would not be inclined to identify the two extremes as the same species.

This form resemble *Thyasira bisecta* (Conrad) from the Miocene of the West Coast of North America. The Pacific species, however, does not reach such a ponderous size. No species of this genus has been reported from the East Coast American Tertiaries. This would seem to give our fauna a closer affinity with the West Coast forms of the Middle Tertiary Stages.

Types.—Pal. Museum, Cornell Univ.

Age.—Probably Middle Tertiary.

Locality.—"One mile west of Godineau River, on the shore of the Gulf of Paria, about midway between San Fernando and La Brea, Trinidad."

Collected by A. C. Veatch in 1912, then of the General Asphalt Company of Philadelphia.

SOLARIELLA S. Wood

Solariella godineauensis, n. sp.,

Pl. 3. Figs. 17, 18.

Description.—Size and shape of shell as indicated by the figures ; body whorl ornamented with three, pronounced, equally distant carinæ ; all of the whorls are carinated but with each succeeding volution the carination is diminished by one ; as the carinæ extend to the apex they become more and more crenulated ; in the concave area between the shoulder and the suture is a smaller keel very strongly crenulated, producing a nodose condition ; these are caused by the intersection of the keels with prominent, radiating ribs which extend from the suture to the shoulder carina, traces of these ribs may be seen on the lower portion of the body whorl ; they have interspaces of about three times the width of a rib ; aperture wide and flaring, this flare extending conspicuously out from the basal margin ; two or three additional revolving ridges extend on the body whorl below the

last carina. Altitude of shell 8 mm ; greatest diameter 9 mm.

Types and specimens figured.— Paleont. Mus., Cornell Univ.

Age.—Probably Middle Tertiary.

Locality.—“One mile west of Godineau River on the shore of the Gulf of Paria about Paria, about midway between San Fernando and La Brea, Trinidad.”

Collected by A. C. Veatch in 1912, then of the General Asphalt Company of Philadelphia.

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* Greatest dimension.

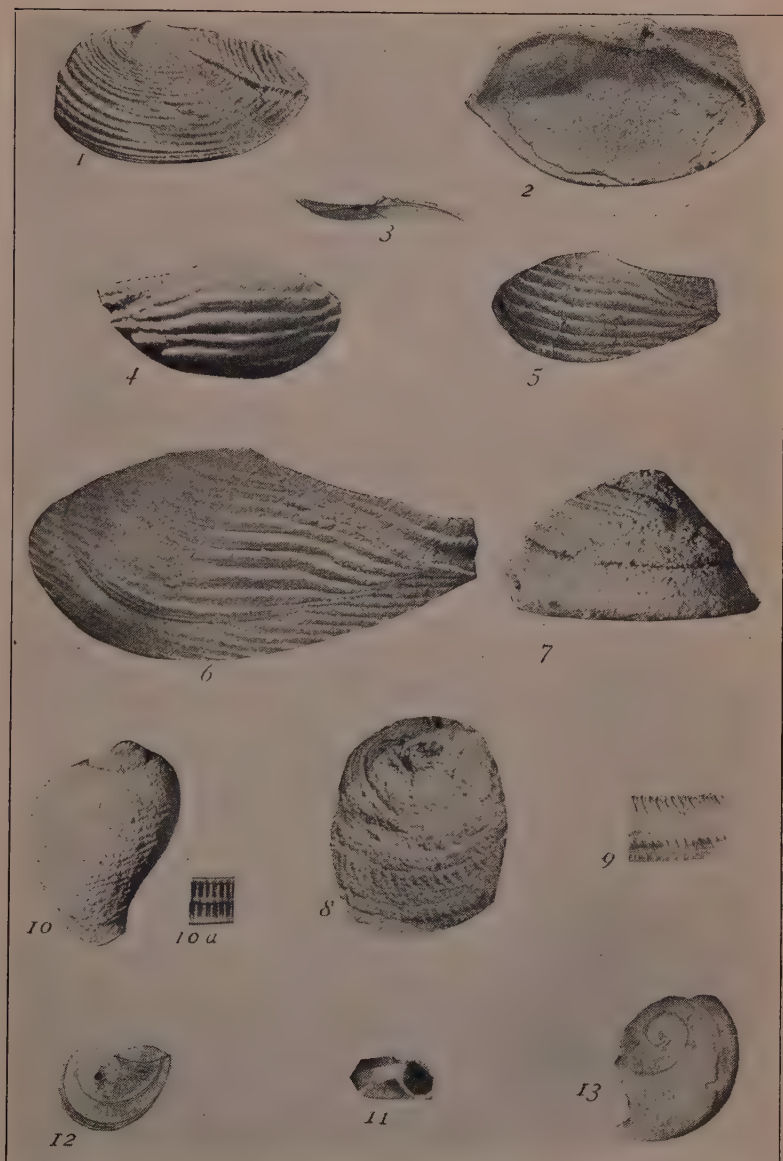


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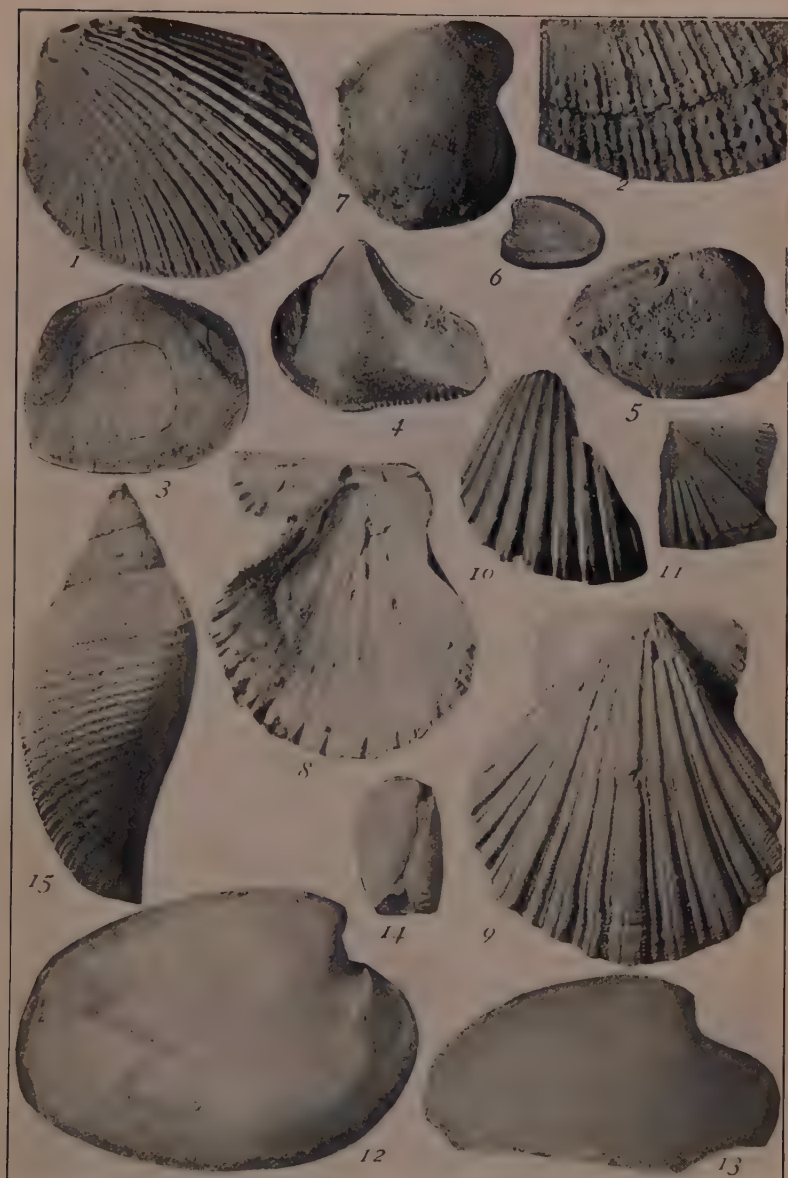


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